Reduction Pollutants in Wastewater Using Alkalophilic Bacteria in Petrochemical Plants

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Background & Objectives: Generally petrochemical wastewater have high pH (pH>11) and COD. According to these characteristics, the activities of microorganisms are difficult in this wastewater and activated sludge rarely occurs. On the other hand a group of microorganisms called Alkaliphiles, are able to grow at high pH easily with high activity.

Methods: In this study we investigate activities of the alkaliphilic bacteria in petrochemical wastewater and estimate their effects on wastewater. In this study, alkaliphilic bacteria have been isolated from petrochemical wastewater by Horikoshi medium and their phenotypic and genotypic characteristics were detected. Then we prepared the conditions for optimum growth of alkaliphilic bacteria in the wastewater. In order to find the abilities and activities of these bacteria, we estimated some factors in their medium like pH, heavy metal content, COD value, aeration, temperature and so on before and after bacterial growth.

Results: The result shows after preparing the conditions of optimal growth and treatment wastewater with alkaliphilic bacteria, the pH of wastewater had been reduced 2 units and also COD shows a reduction about 60%. Activity of these bacteria in wastewater will reduce the heavy metals too.

Conclusion: Overall, this study is unique in its kind. But comparing to past studies that shows activated sludge is able to reduce or remove pollutants our study have suitable efficiency.

Keywords: Alkaliphilic; Petrochemical Wastewater; Horikoshi Medium; COD